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SEPTEMBER 1965
VOL. 31 NO. 2

Soil Conservation

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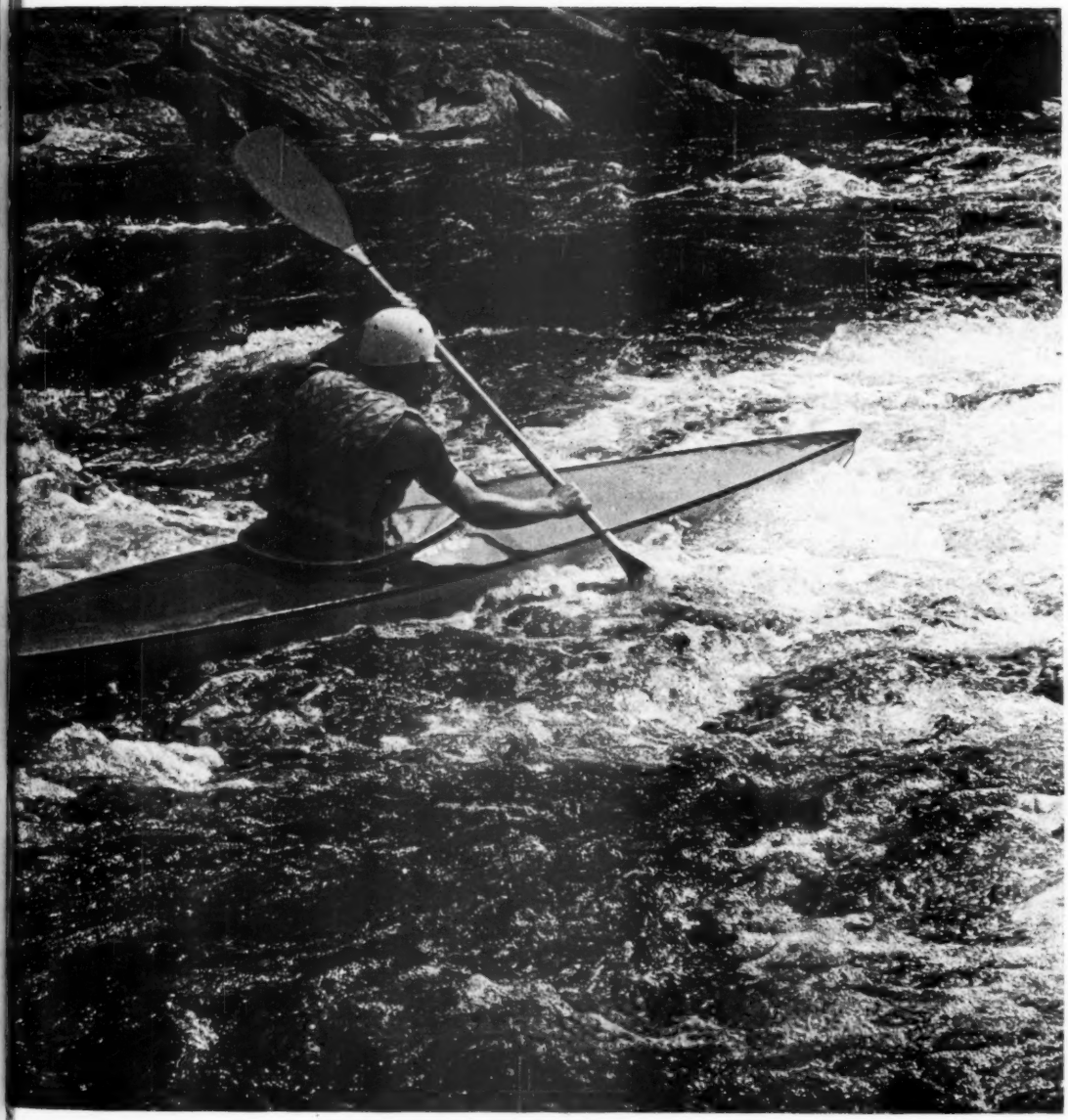

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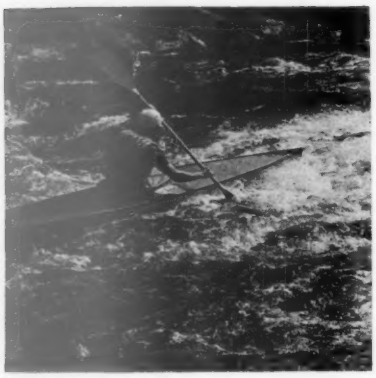

Soil Conservation

Devoted to the wise use of land and water resources

SEPTEMBER 1965 **VOL. 31, NO. 2**

Model . . .

The Nation's attention is focused on the Potomac River basin in the spotlight of the President's recent charge to Secretary of the Interior Udall to replan it as "a model of conservation."

As the Secretary's study groups and planning councils widen to include concerned land use agencies and State and local governments—as all successful resource conservation efforts must—we see a growing realization that the prized values of the main river depend on the care and protection given the upper tributaries and their watersheds.

Our center-spread feature (p. 35) tells the story of the action already under way there in conservation districts and watershed projects. It is fashioned by Writers Bernie Roth and Jim Miller from facts provided by our Watershed and River Basins staffs on what has been done and the much larger task remaining.

Sediment: The multiple damages of soil erosion, wherever it occurs, become more evident every day. The injury is not limited to the void left where the soil is removed; the space occupied where it comes to rest may be even more costly. Texas Field Engineers Vavra and Pearson (p. 33) explain an unfamiliar problem of sediment in irrigation systems and Geologist John Roehl tells (p. 39) how engineers must provide for sediment storage in watershed structures.

COVER: A kayak racer enjoys the rushing white water of the upper Potomac in one of the popular canoeists' events in West Virginia (photo courtesy West Virginia Department of Natural Resources.)

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Bahiagrass and pines provide a pleasing green backdrop as well as effective cover for a stretch of Georgia Highway 29.

The ladies' touch . . .

Highway Beauty In Georgia

By R. W. Oertel
Assistant State Conservationist, SCS, Athens, Ga.

SUPERVISORS of Georgia's 27 soil and water conservation districts welcome the ladies' touch in a concerted drive to stabilize and beautify the State's roadsides.

The Georgia ladies are teaming up to lead the campaign—in women's clubs, garden clubs, federated groups, and soil and water conservation district auxiliaries.

Their goal is to turn the State's highways into corridors of beauty and to focus attention on the natural scenic attractions of the "Peach State."

Helping them do the job are many groups including the conservation districts, town and city councils, county commissioners, the State Highway Department, State and local park boards, planning boards, congressional representatives, watershed associations, PTA's, and others.

They're changing eye-sores into beauty spots of roses, flowering dogwoods, or blooming lilies along traffic arteries through metropolitan areas, small villages, and open expanses of countryside. They're sprucing up entrances into their towns, encouraging highway people to plant flowering shrubs in median strips, turning former ugly spots between highways and railroads into strips of fresh green grass and eye-catching flower beds, and dressing up roadside parks and "pull offs."

One of the most energetic and effective conservation leaders among Georgia women is Mrs. Glenn A. Dowling of Albany, State conservation chairman, Georgia Federation of Women's Clubs. In addition to effectively organizing the conservation activities of the Federation, she carries her personal message directly to local clubs. With a set of colored slides, she travels over the State encouraging women to greater conservation activity.

Erasing eye-sores

Mrs. Dowling has been concentrating on such roadside eye-sores as junk yards, dumping grounds, and litter. Pointing to an auto graveyard on a highway leading into one of the State's largest cities, she asked, "What kind of impression do you think travelers get as they pass this junky looking place? Spots like this detract from the natural landscape beauty. If yards like this are necessary, they can be screened off from the highway or else located in other places."

Mrs. Dowling has recently been selected for inclusion in the 1966

edition of Outstanding Young Women of America, largely in recognition of her conservation leadership.

Mrs. Maurice Cameron, McRae, State conservation chairman, Daughters of American Revolution, is another outspoken woman conservation leader trying to stabilize and beautify Georgia roadsides.

"In too may cases," Mrs. Cameron said, "the highway builders take great care to lay the concrete, asphalt, and gravel just right and then completely forget about the roadsides. There's no reason why they can't do the whole job while they're at it."

The problem of roadside erosion is particularly serious on many highways in Georgia. As much as 359 tons of soil wash off an acre of exposed roadside annually, according to recent studies by the Agricultural Research Service.

Erosion and siltation

Cecil W. Chapman, State conservationist, SCS, emphasizes that the effects of roadside erosion are widespread.

"Not only does this eroding soil leave ugly gully scars behind, but it causes trouble wherever it goes. It fills roadside ditches, clogs road culverts, and spills over into farm drainageways and destroys growing crops. Sometimes it covers city streets and backyards.

"Much of the silt enters streams, destroying natural fish habitat and eventually is deposited in ponds, lakes, and reservoirs. Everyone suffers when soil washes off unprotected roadsides."

Soil and water conservation districts with the help of SCS have set up demonstration projects in many counties to show that a good vegetative cover will stop the destructive erosion. Once that is accomplished — and only then — should shrubs, trees, and flowers be planted to enhance the beauty of the roadsides.

Ugly scars of erosion still mar the view and are a threat to motorists on some Georgia highways.

The Atlanta Soil and Water Conservation District Supervisors and the Fulton County Commissioners are cooperating in carrying out an unusually effective roadside beautification and stabilization program.

"We're proud of what we're doing to beautify our roadsides," said Archie Lindsey of Alpharetta,

The Georgia ladies are concentrating on eliminating such unsightly scenes from the State's roadsides.

one of the commissioners. "We want to grass all the roadbanks in our county as soon as we can."

Lindsey said, "Before we started tying down our road banks, we were continually cleaning rocks and silt out of the road ditches. This costs a lot of tax money that could be used for better purposes."

Daylilies and cannas

In the South River watershed near Danielsville, the Comer Women's Club is working with the Broad River Soil and Water Conservation District in planting daylilies on many of the road banks. Mrs. Howard Strickland, chairman of the Daylily Committee, said:

"All our ladies are quite thrilled about this project. We are helping to make our roadsides more attractive, and, of course, these lilies will help to eliminate those awful gullies along our roads."

An excellent example of well-kept and attractive roadsides can be seen on Georgia Highway No. 79 north of Soperton. Seeded to bahiagrass and bounded by colorful native dogwoods and pines, this 10-mile stretch of highway has been an "eye-catcher" for motorists for more than 15 years.

Women in other sections of Georgia are also helping to beautify the roadsides. For instance, motorists traveling through Colbert during the summer see five large beds of cannas in bloom surrounded by neatly clipped grass borders. They grow in what once was an unattractive strip of land between a highway and railroad track.

The project that the ladies started in 1959 has developed into a real community project, and it's a money-maker, too. Each fall the ladies sell more than $600 worth of tubers to visitors from many States who have admired the beautiful flowers as they traveled through Colbert.

In Columbus, the ladies' clubs spearheaded a drive to beautify the city and highways entering it. Now rose beds in median strips are a pleasing sight on several streets including Victory Drive leading toward Fort Benning. The city also planted decorative trees such as the Purple Thundercloud plum, flowering dogwood, and crepe myrtle.

Wives of the directors of the Middle Oconee River and Walnut Creek watershed associations hear U. S. Department of Agriculture specialists talk about roadside erosion control practices.

Roadside parks

Georgia has some of the finest and prettiest roadside parks in the South. Ladies' clubs have cooperated with county and State highway officials in keeping these parks and pull-offs attractive. For example, the garden club at Alma sponsored and maintains an inviting roadside park which is heavily used.

Many homeowners, businesses, schools, hospitals, and others have taken the cue from these highway beautification efforts. For example, in Columbus, St. Francis Hospital has used pyracantha as an effective screen for its parking lot. Columbus College under the leadership of Dr. Thomas Whitley cooperated with the Pine Mountain Soil and Water Conservation District to develop and apply a conservation plan. Now the rolling campus is not only protected from erosion but is a beauty spot as well.

The ladies of Tifton decided nearly 3 years ago to do something to help women take a greater interest in the conservation effort in Georgia. Members of nine women's and garden clubs in the city worked with representatives of Abraham Baldwin College, the local conservation district, and the SCS in planning and carrying out a conservation workshop for women. Seventy-five women attended the first year, and the number rose to 125 in 1964.

Mrs. Laura Hawkins, LaGrange, southeastern area vice president of the Ladies Auxiliary, NACD, and a long-time women's conservation leader in Georgia, challenged the ladies to action in the keynote

speech at the workshop last year.

"Knowing how to solve these problems is not enough," she said. "Local initiative must still guide and push resource conservation efforts to completion. If we are to correct the problems and preserve the beauty of our natural landscape, we must take positive action." As usual, when the ladies force an issue, they get "positive action." ♦

Two-Thirds of Districts Now Have Updated Programs, USDA Agreements

By T. L. Gaston
Resource Development Division, SCS, Washington, D. C.

THE modernization of soil and water conservation district long-range programs, initiated in 1962 by Secretary Orville L. Freeman's offer to use a broadened memorandum of understanding between the districts and the Department of Agriculture, is now completed in more than two-thirds of the Nation's 2,984 conservation districts.

As of June 30, 1,996 of them had revised their programs and entered into the new working arrangements providing for USDA cooperation in "conserving and improving soil, water, vegetative, wildlife, and related resources, and in reducing damage by floods and sedimentation."

A review of more than 200 of the revised district programs shows several significant trends.

One notable fact is the wide participation of people in the development of the programs. This means that ideas from many interests and sources are being tapped, assuring consideration of a wide range of opportunities and alternatives and adoption of sound objectives.

Broad participation

Obviously, the number of people participating in program development varies from district to district. Those participating commonly include district cooperators and people with both agricultural and nonagricultural interests. Groups participating include service clubs, stockmen's organizations, garden clubs, sportsmen's clubs, recreation clubs, and the like. Representing governmental interests are people from schools, town and county boards, special purpose districts, and local, State, and Federal agencies with responsibilities in conservation and development of land and water resources.

In developing their programs, the districts usually had the guidance of their State soil conservation committee (board or commission). They have made use of many kinds of information. Most frequently used are summaries of the Conservation Needs Inventory, soil surveys, town and county land use plans, watershed project plans, economic development plans, and census data.

About two-thirds of the districts describe basic conditions and opportunities for improvement by land capability classes or kinds of land. In others, land resource areas are used.

Some of the programs include a brief description of the district's major operating policies, such as time and place of regular board meetings, criteria for determining priorities in planning and application assistance, guides for selectivity in planning, and methods for handling district-owned equipment.

Nearly all programs reviewed had been printed. In many, pictures are used to describe conditions, opportunities for improvement, and the ends sought.

Economic and social effects

In most, the effects of resource conservation and development on social and economic conditions are pointed out. Some included descriptions of current social and economic conditions and the improvements expected.

In updating their programs, districts are focusing their attention

Status of District Programs June 30, 1965

State	Districts Number	Updated programs Number
Alabama	66	51
Arizona	37	16
Arkansas	76	75
California	164	56
Colorado	94	72
Connecticut	8	8
Delaware	3	0
Florida	60	38
Georgia	27	18
Idaho	54	14
Illinois	98	45
Indiana	87	61
Iowa	100	74
Kansas	105	73
Kentucky	121	101
Louisiana	26	26
Maine	16	15
Maryland	24	8
Massachusetts	15	11
Michigan	81	70
Minnesota	89	83
Mississippi	74	73
Missouri	65	45
Montana	62	41
Nebraska	86	67
Nevada	36	15
New Hampshire	10	6
New Jersey	14	13
New Mexico	56	29
New York	48	48
North Carolina	88	40
North Dakota	70	70
Ohio	88	88
Oklahoma	87	59
Oregon	61	19
Pennsylvania	62	4
Rhode Island	3	2
South Carolina	45	44
South Dakota	68	34
Tennessee	95	87
Texas	183	99
Utah	43	14
Vermont	13	13
Virginia	31	12
Washington	69	44
West Virginia	14	12
Wisconsin	72	72
Wyoming	45	2
Alaska	12	2
Hawaii	15	10
Puerto Rico	17	17
Virgin Islands	1	0
Totals	2,984	1,996

on the challenges of today and tomorrow. A current district program widely available to land owners and residents can serve as a guide to local activities in resource conservation and development. In addition to being a foundation for the district's annual work plan, it can influence the activities of individuals, groups, and agencies concerned with the subjects involved. It can also be useful to schools and churches in conservation education. In a number of instances, district programs have become a basis for land planning decisions of town and county officials. ♦

Maine Marshland Becomes Bird Haven

"We've enjoyed birds so much that we decided we wanted to do something about it."

So the Martin Frenches of Dover South Mills, Maine, are planning a sanctuary with Soil Conservation Service help through the Piscataquis County Soil and Water Conservation District.

Their dairy farm of more than 400 acres includes 75 acres of marshland bordering on Branns Mill Pond. With the help of the local soil conservationist and SCS Biologist David N. Allen, the Frenches developed a conservation plan with special wildlife practices. The plan includes nature trails, food plots and shrub plantings, and small watering facilities.

The Agricultural Conservation Program will share the cost of some of the practices.

The Frenches, licensed bird-banders, have recorded sightings of more than 150 species of birds on the farm, including some quite rare in central Maine.

Neighbors, guests, and out-of-State visitors will benefit from the Frenches' conservation thoughtfulness as much as the birds will.—ELMER A. STEVENS, *Work Unit Conservationist, SCS, Dover-Foxcroft, Maine.*

Security for Missile Sites

Erosion control methods protect Polaris bases at southeastern naval facilities

By A. T. Chalk
State Conservationist, SCS, Columbia, S. C.

EROSION begins when raindrops hit bare soil, whether it be mounded over a Polaris missile magazine, on the slopes of an aircraft runway enbankment, on a drill area, or a farmer's field.

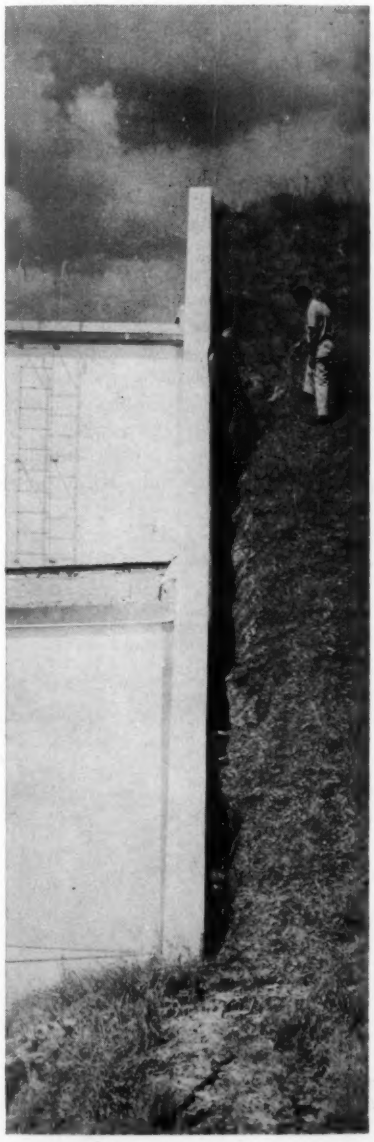
Devising ways to control erosion on the unusual conditions of U. S. Navy installations adds variety and challenge to the work of SCS conservationists assisting them.

Protecting Polaris missiles

At the U. S. Naval Ammunition Depot near Charleston, S. C., Polaris missiles are stored in huge magazines over which raw earth was piled to a height of 15 feet or more. Each rain brought some of the soil down. To hold it in place, SCS Work Unit Conservationist James S. Livingston and his staff recommended a thick-growing sod of grasses and legumes to cover the magazines. The treatment was made a part of the conservation plan worked out with Capt. William Heaman, director, Southeast Division, Bureau of Yards and Docks, under a conservation agreement with the Berkeley Soil Conservation District.

Another part of the Navy complex faced a similar problem at the Marine Corps Air Station, Beaufort, where extension of an 8,000-foot runway required diverting of meandering Mulligan Creek,

The U. S. Naval Ammunition Depot, Charleston, S. C., won the Navy Department's Natural Resources Conservation Award for 1964 and was runner-up for the Secretary of Defense Award. The work described in this article contributed to the achievement.



Earth washing away from a defense building at the Polaris Missile Facility makes a problem for conservationist.

the removal of marsh muck from the extension area, and backfilling with good soil.

The new fill averaged 30 feet in height, with sides sloped as for highways. This valuable embankment had to be stabilized with vegetation, and quickly.

SCS Work Unit Conservationist Ray E. McLin supervises the technical assistance provided to Commander Daniel E. Connelly, public works officer of the facility, on the basis of a conservation agreement between the Air Station and the Beaufort-Jasper Soil Conservation District.

Grasses do the job

"There is no blanket recommendation that can be given for a job of this kind," McLin says. "We use bahiagrass, bermudagrass, and perhaps other plants, depending on the soil types, the slopes of the fill, and other factors. Varying amounts of fertilizer are needed. We recommend a light asphalt mulch to hold the seed in place and give some temporary cover."

Other problems grew out of the construction job. Lateral ditches spilling into the new channel for Mulligan Creek enlarged into gullies. Sediment washed from them began to fill the channel. Structures were devised to let water in without erosion.

The beautiful lawns of bahiagrass and bermudagrass around the buildings, training grounds, and play areas of the Naval installations at Charleston and Beaufort are conservation measures as well as ornamentation.

The grass must be able to carry heavy traffic and yet maintain a good sod for soil protection. The grass on gently sloping roadsides is kept mowed and gives the appearance of park areas, but the roadsides are waterways that carry runoff water.

Keeping shipshape

Naval officers and enlisted men may be rotated frequently, but there is continuity in carrying out and maintaining the conservation work.

Keith Lange is natural resources conservationist for the Southeast Naval complex. In that capacity he gives general supervision to the conservation program, to forestry management, to fish and wildlife, and to other natural resources. He works with Federal and State conservationists, foresters, biologists, and other specialists, also.

Russell Dodds, soil conservation engineer in Lange's unit, supervises the soil and water conservation activities in all installations in the Sixth Naval District. Dodds was formerly an engineer with the Soil Conservation Service.

The Navy keeps its extensive land holdings in the Sixth Naval District "shipshape" through soil and water conservation and other resource development programs. Grass and trees that protect the land are important in the same way that paint is important in protecting a ship. Both represent the stewardship of public property, the protection of the taxpayer's investment in defense. ♦

Soil Conservationist J. S. Livingston (l.) discusses a gully problem with J. A. Cox of the Navy.

Soil Characteristics Restricting Root Zone

There are several soil characteristics that restrict plant growth in the root zone and present hazards or limitations to land use. These include low moisture-holding capacity, stoniness, shallowness to layers that limit root development, acidity, salinity, alkalinity, and low fertility that is difficult to correct. The importance of the different limitations varies in different regions. ♦

Tree Windbreaks

Tree windbreaks and shelterbelts have been shown to save 20 to 30 percent on fuel and costs, account for 35 pounds more gain on cattle, control snow drifting, reduce soil erosion, and reduce evaporation. Shade and wildlife protection are additional benefits. ♦

Silt in Water Changes Infiltration Rate and Alters Irrigation Design

By Martin E. Vavra and Robert F. Pearson
Engineering Specialist and Civil Engineer, SCS, Uvalde, Tex.

ASIDE from direct damage to crops covered by deposition, silt in irrigation water from major streams or eroding canals may cause serious problems in the design of irrigation systems.

If the layer of sediment laid down on the soil surface changes the infiltration rate, as it commonly does, the system may not function as it was intended.

In the Eagle Pass area of Texas, irrigation water comes from the Rio Grande River. The silt load varies widely, rising to more than 1 percent by weight at times. At other times it is almost negligible.

Field studies by the Soil Conservation Service show that infiltration rates in some instances have been reduced to 31 percent of the original rate after considerable use of the silt-laden irrigation water. Irrigation system designs on these soils have to be evaluated and adjusted often in order to attain proper distribution of water. This is especially true with dense sod and close-growing crops which act as a filter. Silt is deposited whether the irrigation tab is graded or level. The deposits have some effect on infiltration rates of heavy clay soils and great effect on coarser textured ones.

The seriousness of the problem is illustrated by experience on the Dick Henderson farm near Eagle Pass. One application of 3.5 inches of water left 0.1 inch of silt on the soil surface. At the end of a year's irrigation, approximately 2 inches of silt had accumulated in bermudagrass 50 feet from the irrigation lateral that supplies the water.

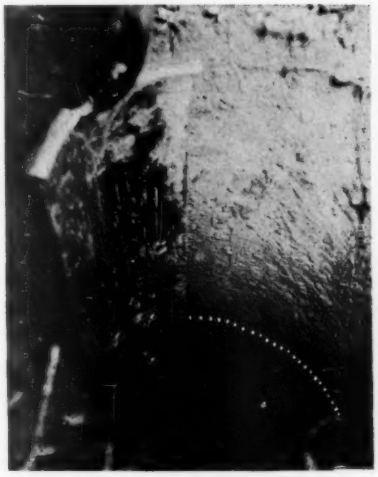
Obstruction to flow

A study of a graded irrigation system on the John E. Minnie farm showed that silt had deposited to a depth of 12 inches 50 feet from the lateral during a 3-year period. The field had a grade of 0.1 foot per 100 feet in the direction of irrigation. It was seeded to bermudagrass in 1962 and replanted to alfalfa in 1964. Approximately 60 inches of water was applied each year.

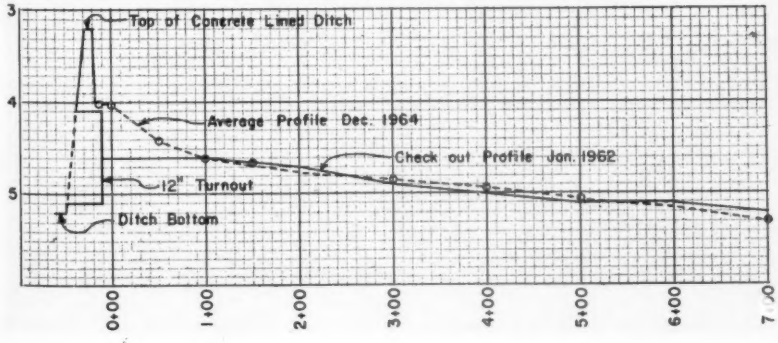
Getting an adequate head of water from the irrigation lateral into the tabs is becoming a problem on some fields because of the accumulation of silt near the lateral.

Approximately 40,000 acres is being irrigated in the Eagle Pass area, and large acreages of bermudagrass and alfalfa are being planted. Much of this land will be irrigated with graded systems. The immediate problem is to design the systems for efficient water application now and in the future. The areas planted to bermudagrass

Approximately 2 inches of silt (above) was deposited in bermudagrass during 1 year of irrigation following land leveling. In 3 years (below) 12 inches of silt accumulated 50 feet from the lateral.



Profile of land surface on completion of land leveling (solid line) and after 3 years of irrigation (broken line). The scale, expressed in feet, is exaggerated vertically.



and alfalfa may have to be mechanically renovated to break up the layers of silt so that water can pass through more freely.

Even with renovation, the amount of fine silt deposited and mixed into the plow depth or top 6 inches of the soil may alter the infiltration rate enough to require redesign of the system to get more even and efficient distribution of water.

An improved vegetative cover and watershed protection measures are needed on the watershed of the Rio Grande to reduce the quantity of silt in the runoff water. In the meantime, conservation farmers and engineers will have to take the silt accumulations into account in designing and using irrigation systems. ♦

Conservationist and Watershed Dam Stand Test of Colorado Storms

THE week of June 14 in Colorado was one of disaster. Floods and tornadic winds wove a patchwork of havoc across the State's eastern half.

It was a period of severe testing of local and public investment in upstream watershed projects. Among them were the Kiowa Creek pilot project and the Big Sandy Creek project, both structurally completed and ready.

A key dam in the Big Sandy project is the mile-long Ramah Dam, built in 1964 with 500-acre-foot capacity added in a permanent pool for fish and wildlife. In this phase of the project the Big Sandy Soil Conservation District was joined as a sponsor by the Colorado Department of Game, Fish, and Parks.

In this storm the Ramah Dam—with others in the project—paid handsomely for the reliance placed in it. Folks generally conceded that it saved the town of Ramah and much of the downstream resources.

Don Smith, SCS work unit conservationist assigned to the Big Sandy District, looks back on June 17 as the most exciting hours of his life. He tells it this way—

I had returned home from Colorado Springs that afternoon after abandoning my car and seeing it swept off the highway by a stretch of high water.

At home I glanced from the window and saw the first water beginning its race down the usually dry creek bed. It meant that the principal spillway in Ramah Dam was discharging.

It also meant a downpour above the dam on the watershed had sent thousands of acre-feet of water into the flood pool. The water level must have risen rapidly.

We got into a pickup and started for the dam. At the bridge a worried group had gathered. It occurred to me that a heavy flow from an area draining into the creek below the dam might cause trouble. I drove back and asked Mrs. Smith to call the people living near the creek and tell them of the possibility.

About this time the report was circulated that the dam had failed. If that were true, the danger was vast and imminent. People began calling about it. I didn't know it at the time but a motorist had seen the mighty flow of water across the 600-foot-long emergency spillway. To the untrained eye that was enough to cause panic. Still, I couldn't believe the dam was failing under any conditions. I had seen it built, inch by inch, with the best engineering supervision and the best equipment available.

I decided to check. My son, Woody, and I drove to the dam. It was pitch dark, and the wind was hard from the southwest.

We got to the dam and walked its length by the light of a flashlight. I had never expected to see the water that high, within 2 feet of the dam's crest. The emergency spillway was a mighty cascade 3 feet deep.

I could see the water was receding slowly. We drove back and called the telephone office. It was nearly 2 a.m. but the operators—bless 'em—agreed to pass the word that the dam was safe, that the town was in no danger. Then at home we crawled into our beds for a few hours of rest. ♦

The mile-long Ramah Dam stands intact after intense storms had sent water over emergency spillway.

For beauty, pleasure, utility . . .

Small Dams, Conservation Help Make 'Model' Potomac

PRESIDENT Johnson's call for beautification of the Potomac River basin and development of its recreation potential finds response in the small watershed projects and land treatment measures already completed or under way in the Potomac watershed.

The President's charge, contained in the White House Message on Natural Beauty, points up the efforts already made by Federal and State conservation agencies to restore and preserve the natural resources of the Potomac valley.

The U. S. Department of Agriculture has been working for a long time to achieve many of the features considered essential elements of a plan for the Potomac.

Cooperation between land owners and operators, and Federal, State, and local authorities, has given a headstart to a concerted drive to make the Potomac run clean again and have its valley used wisely wherever the hand of man touches it.

The progress has been gratifying. Yet, statistics clearly show the need for still greater effort before the Potomac will "serve as a model of scenic and recreation values for the entire country," which is President Johnson's aim.

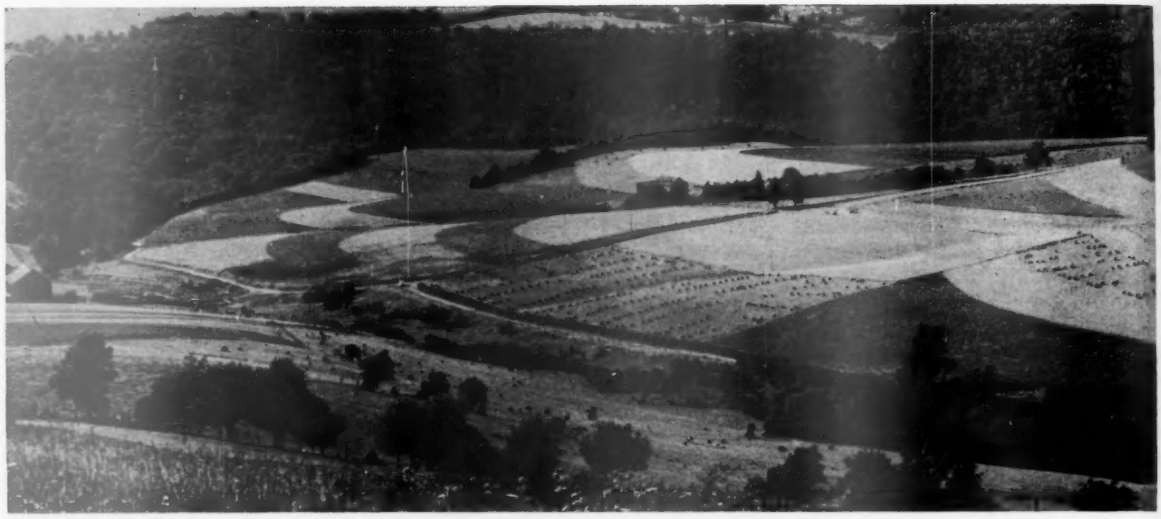
The 14,780 square miles of land draining into the river contribute about 2.5 million tons of mud, silt, clay, and organic debris to its estuary each year, according to SCS specialists. In addition to this sediment, the river carries a large load of dissolved materials. Scientists estimate that the annual chemical load past Washington is 1.4 million tons.

Urban development has contributed heavily to the conservation problems in the Potomac basin. Land damage in the form of flooded tributaries, silt-laden currents, and sediment-clogged channels follow the trail of the bulldozer.

A major sediment source area is in that portion of the basin above Washington which has an 11,500-square-mile watershed. Nearly 9 million acres in this part of the basin is classed as agricultural land. Less than half of this acreage is cleared. Although the work of the soil conservation districts has been advancing in the upper Potomac region, much remains to be done to assure adequate use and treatment of farmlands.

SCS began assisting Potomac basin farmers with their soil and water conservation problems 30 years ago. Local soil conservation districts have been working with SCS for almost as long.

The lasting beauty of the dark reaches of the upper Potomac depends on permanent protection by well-managed forests, conservation-treated farmlands, and small watershed dams.



Many landscapes in the Potomac basin attest to the sound conservation practices applied over the years.

Floodwater-retarding dam in West Virginia serves also as a municipal water supply.

Riprap protects the toe of a small watershed dam where an outlet pipe empties overflow water downstream.

Federal and State Extension Services of the basin States have pioneered educational work in soil and water conservation.

The Agricultural Stabilization and Conservation Service has been providing cost-sharing payments to help in the installation of selected conservation practices; and the Farmers Home Administration has been arranging loans for conservation improvement.

The whole Potomac basin with the exception of parts of Fauquier County, Va., is in soil and water conservation districts. There now are 22 conservation districts partly or entirely within the basin. Nearly half of the 43,000 farmers in the basin are district cooperators. About one-third of these have basic conservation plans.

More than half the Potomac basin is in forest. Multiple-use management of more than 200,000 acres in the Monongahela and George Washington National Forests has resulted in evident conservation and improvement. Additional national park and State-

owned land, which also are being improved constantly, bring the total of public land in the basin to about 13 percent.

Despite a long history of abuse and deterioration, the now-improving forest resources, the rugged mountain barriers, rolling hills, and verdant valleys of the Potomac present a unique and striking area of natural beauty.

The landmark Flood Control Act of 1944 authorized extensive Federal participation in efforts to reduce floods and erosion damage through structural and land treatment measures. An area of 4,205,400 acres in the upper basin was brought under the act as one of 11 major flood prevention projects in the Nation. The project area comprises about 57 percent of the basin above Washington.

Subwatershed work plans have been completed for 9 locations, and planning is under way for 2 others. Construction is finished in 3 locations with the installation of 8 floodwater-retarding structures and 5 channel improvements. Construction is under way in 6 other locations where approximately 100 structures are being built.

Because a large part of the Potomac upper basin is being treated under the 1944 act, there is limited use of the watershed protection and flood prevention program under Public Law 566. One Public Law 566 application is pending, one project is approved for planning, and two projects are approved for construction.

In the report following a recent coordinated survey of water and related resources of the Potomac basin, USDA and the Army Corps of Engineers recommended construction of 418 upstream reservoirs as an element of a comprehensive plan. These reservoirs would be of the same general type as those being built under Public Law 566.

A review of this study would place more emphasis on recreation and fish wildlife enhancement in the basin.

Where effective conservation measures are not employed during construction (above), urban developments contribute heavily to stream sedimentation. Soil stripped of its natural cover was left unprotected for 2 years during construction of a highway (below) near Washington.

Water sports, like this canoe race (above), are popular on the Potomac and its tributaries. Small watershed structures protect these major streams, leaving the watercourse open for navigation. Recreation and rustic beauty (below) go hand-in-hand where waters run clean between protected streambanks and conservation-treated uplands.

As sound conservation practices are applied to the upper Potomac basin, security of its treasure of natural beauty nears reality. Already, subwatershed land improvements visibly enhance the approaches to outstanding tourist attractions, such as the Shenandoah National Park on the Blue Ridge, Harper's Ferry National Park, Cacapon State Park in West Virginia, and George Washington and Monongahela National Forests.

Carefully managed carpets of pasture, well-tended woodlots, and scientifically contoured croplands all testify to long-term cooperation between landowners and conservation agencies in the Potomac River basin.

The going programs of the USDA are an integral part of the Potomac River improvement plan. For years they have made a substantial contribution toward developing the Potomac valley as a model of beauty and a center of outdoor recreation for the Nation. ♦

Where to put it—that's the problem

Sediment Basin Is Crucial In Watershed Dam Design

By John W. Roehl
Geologist, Engineering Division, SCS, Washington, D. C.

MOST of the structures in watershed protection projects are built for the primary purpose of retarding floodwaters and protecting valley lands from damage.

High among the damages to be avoided are the deposits of sediment on bottom land fields and pastures, on roads and streets, and in flooded buildings.

To the extent the dams are successful in holding back sediment, they create a hazard to their own effectiveness that could eventually put an end to their usefulness.

So, provision for storage of sediment is a crucial part of the design of each floodwater-retarding dam. SCS geologists can predict the rate of sedimentation in each watershed, and engineers can then plan each structure to function under the expected conditions, after practical land treatments have been applied.

A useful life

When other purposes are added to flood prevention—as is the trend today—the problem becomes even more complex. More and more projects are planned also for water supply for irrigation, urban, or industrial use, for fish and wildlife habitat, and for recreation.

The structures are designed and built to provide their intended function for a specified number of years—usually 50 to 100—and provision for the expected accumulation of sediment must be taken into account. Otherwise, the sediment would encroach on the storage space provided for the supplementary purposes, and the structure would soon fail to function as intended.

Product of erosion

The sediment storage required in a reservoir depends on a number of different factors. These include the amount of erosion occurring in the drainage area of the reservoir; how much of the eroded material will be brought down to the reservoir; how the sediment will be distributed within the reservoir; and what its ultimate volume will be.

SCS geologists have studied these factors in detail and have evolved streamlined procedures for rapid estimation of the sediment storage requirements of watershed structures.

Since sediment is the product of erosion, the first step is to determine the amount of erosion occurring in the area draining to the structure. Sheet erosion is computed by a standard equation that takes into account the character of soils, the land use conditions, length and degree of slope, and rainfall. Amounts of channel erosion, such as that derived from gullies, streambanks, and roadsides, are determined by local field studies.

Not only must the geologist determine the amount of erosion occurring at the time of planning, but he must anticipate the reductions that will be achieved by the application of land treatment measures, which are an integral part of any watershed protection project.

Not all of the soil material eroded from the uplands will reach the reservoir, of course. Much of it will be deposited on the lower-lying portions of sloping fields; some will be caught in grassed areas; and some may be deposited

Sediment deposits on bottom-land fields are one of the principal damages to be prevented by watershed protection projects.

This article is based on an unpublished manuscript by the late L. C. Gottschalk written shortly before his retirement from the position now held by the author.

on flood-plain areas during high-water flows.

So, as the second step, a correction factor is applied to the erosion estimate to determine how much of the eroded material will reach the reservoir as sediment. This correction factor is termed the "delivery ratio," and studies have been made that relate this ratio to several influencing factors, such as the size of the drainage area, the stream length, watershed relief, and others.

Trap-efficiency

The next step is to determine how much of the sediment reaching the reservoir will remain in it. A portion of it will be deposited in the basin, but a part will pass on through the structure and on downstream. The ability of a reservoir to retain a portion of the incoming sediment is termed its "trap-efficiency."

Trap-efficiency varies with each reservoir and is influenced by several factors. The Soil Conservation Service is making measurements of the trap-efficiency of a number of reservoirs throughout the country to obtain basic data concerning this factor of design. The sizes of the sediment particles, the electro-chemical nature of the water, the shape of the reservoir, the length of time the water-sediment mixture is stored, and the annual water inflow are among the items being considered in the study.

Until the data are collected and analyzed, however, SCS geologists are using the relationship between trap-efficiency and the "reservoir capacity—annual inflow ratio" to estimate the amount of sediment that will remain in the reservoir.

These three steps tell how many tons of sediment must be provided for by the structure. Now the geologist must determine how much space must be provided to accommodate the deposits and where it will be located. If too little space is provided, the pool is underdesigned and the sediment will encroach on space intended for other uses; if too much, the pool is overdesigned and the cost of the structure is more than it should be.

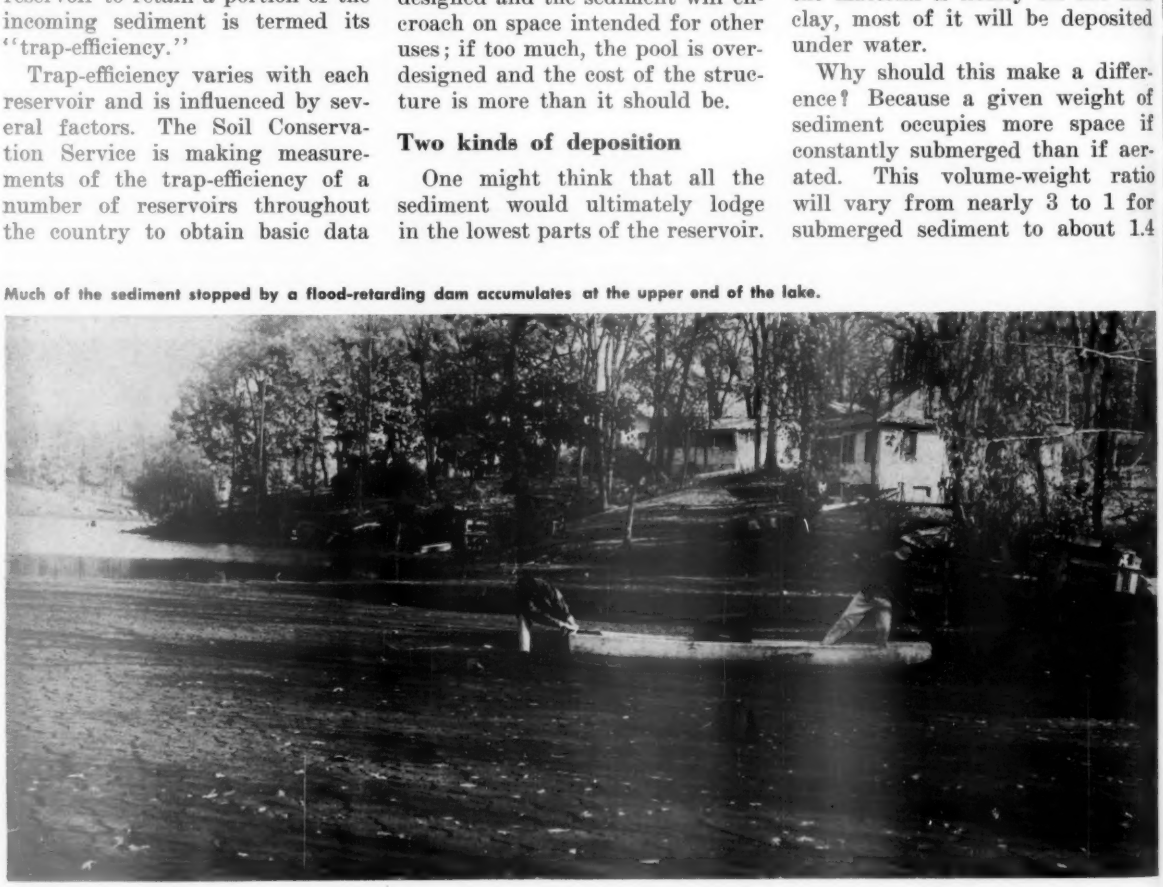
Two kinds of deposition

One might think that all the sediment would ultimately lodge in the lowest parts of the reservoir. But not so. Some of it is deposited at upstream portions of the lake where it is under water only during high water stages and is subjected to the drying action of the air at intervening times. Other sediment reaches the lower parts of the pool and may never see the light of day again.

These two different environments of sediment are described as "aerated" and "submerged," and the proportions of each are important in designing the sediment basin. The ratio of aerated and submerged sediment is determined in part by the sizes of the particles. If there is a predominance of large material, such as sand and gravel, a relatively greater portion will settle out in the backwater areas and be subjected to alternate drying and wetting. Conversely, if the material is nearly all silt and clay, most of it will be deposited under water.

Why should this make a difference? Because a given weight of sediment occupies more space if constantly submerged than if aerated. This volume-weight ratio will vary from nearly 3 to 1 for submerged sediment to about 1.4

Much of the sediment stopped by a flood-retarding dam accumulates at the upper end of the lake.



to 1 for aerated sediment. Thus, more space must be provided for a given number of tons of sediment in the submerged condition than for the aerated.

Another factor that must be considered is that sediment compacts as more is deposited, and this, too, bears on the final amount of space that must be provided.

The geologist takes all of these many factors into consideration as he develops sediment design information for a reservoir.

The engineers and planners then can make realistic decisions about the useful life and cost of each structure. ♦

Conservation Combined With Camping Wins USDA Award for Boy Scouts

By Stuart O. Hale
Outdoor Writer, Providence (R. I.) Journal and Bulletin

RHODE Island's Narragansett Council, Boy Scouts of America, had a host of problems to solve in maintaining the natural beauty of its 2,100 acres of Scout reservations while supporting one of the most intensive camping programs in the Nation.

At the Yawgoog Scout Camp in Rockville, the largest boys' camp in New England, as many as 1,200 boys use the facilities each week during the summer season. Outpost camps in other locations also receive similar hard use.

Long-range plan

Working with conservation plans developed in cooperation with the Rhode Island soil and water conservation districts and assistance of SCS conservationists, State foresters, and others, the Scouts set to work to fight erosion, reforest blighted regions, and prevent forest fires. They set out on a long-range sustained-action soil and water conservation program.

Last year's achievements won them the 1964 USDA Gold Seal Conservation Award, the highest honor in a nationwide program of recognition for conservation achievements in Scouting.

Since the program was initiated in 1960, only 3 councils have received the Gold Seal Award for the best conservation program in the Nation. Green Seal Awards have been given to 55 councils for regional excellence.

There were serious erosion problems at Yawgoog where as many as 10,000 pairs of feet tramp out the grass on slopes leading down to a half-mile-wide pond. As a part of the conservation plan, a series of miniature diversions were constructed, hard-used traffic lanes were closed, and new ones opened. Some worn areas were seeded and protected until they could be opened for use, while others were closed for more extensive rehabilitation. An old dam was repaired to recreate an 8-acre wildlife pond. New fire lanes were constructed.

Fire scars healed

At Kelgrant, on the Pettaquamscutt River, a forest fire in 1961 had denuded some of the best acreage. Last year 22,000 trees were planted, and thousands of young pine seedlings planted previously were released from undesirable overtopping growth. The fire, incidentally, was not started by Boy Scouts but by careless campers just outside the Scout reservation.

At Champlin Reservation, on the edge of the Providence metropolitan area, a "showplace" scouting area has been established that receives intensive day and overnight use.

Tree and shrub plantings for cover and soil protection were part of the conservation plan.

Here a fine trout pond was built and the stream channel was improved with riprap, grading, and seeding. A short ski slope was seeded and fertilized, and 2,000 trees and shrubs were planted for cover and soil protection. An erosion problem created by relocation of a State highway was solved by construction of a stone barrier to divert excess runoff water.

Working with Scout troops that go on assigned patrol duty and using an old fire truck, the Champlin staff has developed a special protection program during forest fire season.

At Aquapaug, an outpost camp on Worden's Pond, Scouts planted 10,000 trees and cut fire lanes.

In nearby Rehoboth, Mass., on the Buxton-Frontier area a swimming hole was created on the Palmer River, fire lanes were built,

Mr. Hale is current winner of the Meeman Conservation Award sponsored by the Scripps-Howard Foundation. All photos are courtesy of the *Providence Journal*.

and the shores of the river were cleaned up and seeded. Using a soil survey the Scouts located the best areas for a playground and parking lot.

In northwestern Rhode Island, the Narragansett Council maintains a 275-acre tract called Winnesuket, on the shores of Wakefield Pond. Here some fire lanes and trails have been built, and a continuing conservation plan is being followed to enhance wildlife values and develop a woodland management program.

Conservation training

Narragansett Council is an organization of nearly 25,000 boys and adult leaders, the majority of them from urban communities. As a result, much of their conservation training is through the Scout program. In addition to weekend work parties, which on occasion have numbered several thousand boys and leaders at a time, the council supports an education program.

Each summer at Yawgoog, six conservation films are shown to thousands of campers. Last year troops from throughout the State and nearby Massachusetts sent several hundred leaders to a special conservation workshop at the big base camp. Over a 3-day period the boys received training from SCS conservationists, State forestry and fish and game technicians, and others. Each then returned to his individual troop to pass his newly acquired knowledge on to other Scouts. ♦

A group of Boy Scouts cuts saplings to prepare the way for a fire trail.

The beauty and peacefulness of nature, a fire trail, and a road—all in one.

More Districts Subscribe To Our Magazine

The Upper Salinas, Las Tablas, and Parkfield-Cholame soil conservation districts in California not only pay for subscriptions to *Soil Conservation* for each of their 15 directors, but they go even further. They subscribe for the magazine to be sent to various elementary and high schools in the area and to be placed in 12 doctors' waiting rooms. ♦

Annual Cassoday Lion's Hunt Draws Sportsmen to Kansas Town

By Glen P. Snell
Range Conservationist, SCS, Emporia, Kans.

EVERY fall, for the past 4 years, some 800 to 1,000 hunters have converged on Cassoday, Kans., population about 100, to participate in the "Cassoday Lion's Hunt."

The event, sponsored by the Cassoday Lion's Club, marks the opening of the prairie chicken hunting season. Proceeds from the hunt are used for community services.

Lion's Club members contact farmers and ranchers within a 15-mile radius of Cassoday for permission to hunt the prairie chickens on their land. The landowners are not paid, but they are protected against damage to their property by insurance included with the permits issued to the hunters. Permits for the first 2 days of the prairie chicken season sell for $2.

The hunter is given a map showing land in the Butler County and Chase County soil conservation districts on which he may hunt. For $1, a hunter can roll out his sleeping bag on the basketball court of the Cassoday Grade School building, or sleep on a gym mat. For an additional $1 he can have a hearty breakfast, which is served beginning at 2:30 a.m.

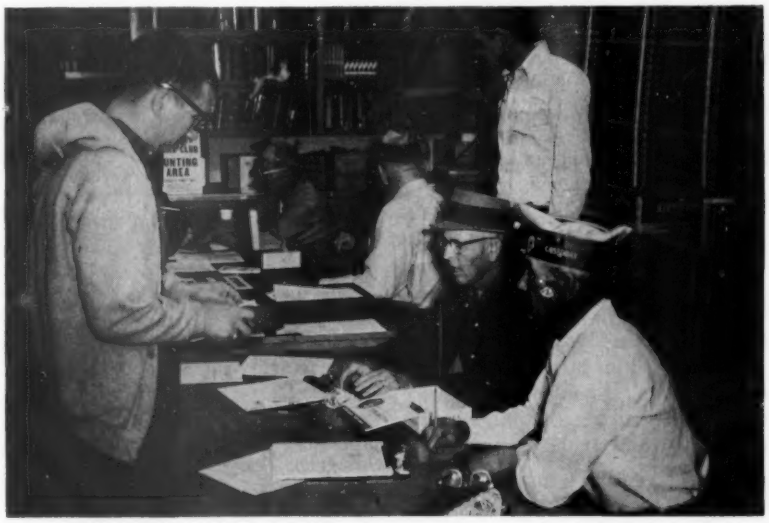
The hunters start moving out about 4 a.m. They wait in the prairie grass for the chickens to come flying in to feed on the nearby milo fields.

The tall prairie grass is the natural habitat for the prairie chicken. Adjacent fields of milo, soybeans, and wheat add to the fall diet of these birds and serve as a point of concentration from which they can be hunted.

Prairie chickens must have good native grass cover in the spring when they nest. At least half of the previous year's growth of major grasses should remain as winter and spring nesting cover.

As long as the rangeland is properly grazed, there will be a good habitat in the bluestem hills for prairie chicken production. As long as men respect their hunting privilege, hunters can safely harvest the birds on grounds made available by cooperating landowners. ♦

Hunters are registered and sold permits on the day before the prairie chicken hunt begins.



George Odgen and sons, Ron and Jim, from Wichita, Kans., have had a successful hunt on their first day out.

Farmer Helps His Neighbors Plant Pines to Replace Cultivated Crops

By C. M. Henninger
Woodland Conservationist, SCS, Nashville, Tenn.

THROUGH his enthusiasm and influence, James Leggett of Big Springs Community in Meigs County, Tenn., has stimulated reforestation and woodland management in his community, although he owns only 68 acres of his own.

In the 1964-65 planting season, 41,000 pine seedlings were planted by Leggett's neighbors and relatives, largely as a result of his leadership, says Edd Norman, chairman of the Meigs County Soil Conservation District.

In recognition of his conservation work, the board appointed Leggett as an assistant soil conservation district supervisor. In this new position, he will take part in an advisory capacity in all board meetings.

When James Leggett bought a 98-acre farm in the Big Springs Community in 1942, his six children helped him carry on his farming program. About 40 acres were devoted to raising cotton, tobacco, corn, hay, and truck crops.

Less labor

"But children have a way of growing up and seeking greener pastures," Leggett explained. "As each one graduated from high school and went to work or got married, my labor force dwindled. The last one left home about 10 years ago."

Earlier, Leggett got a job driving a Meigs County school bus, and for the last 16 years he has been an employee of the Meigs County Board of Education. Since this work also cut into the time he could devote to farming, the acreage planted to crops declined and some of the land lay idle.

"I had more land than I could handily tend," Leggett said, "so in 1957 I sold about 30 acres to a paper company."

The paper company had recently built a mill 10 miles from Leggett's farm. The new market for pulpwood stimulated interest in timber growing in the community and promised a market for young trees.

In 1959, Leggett decided to grow trees on his extra land. E. H. Whitaker, SCS work unit conservationist assisting the Meigs County District, helped obtain seedlings from the Tennessee Division of Forestry and showed him how to plant them. Leggett reforested 7 acres and each succeeding year planted a few more acres. The Agricultural Conservation Program helped share the cost.

Conservation plan

In the spring of 1963, Leggett developed a conservation plan with the district for his 68 acres. Using a soil and land capability map prepared by SCS Soil Scientist R. B. Warren, Leggett and Whitaker selected 12 acres of his best land to be farmed in a 3-year rotation of cotton, oats, and lespedeza. Seven more acres planted to loblolly pines brought his total of new pines to 22 acres.

There were also 33 acres of second growth pine and hardwoods. Most of the hardwoods had been severely damaged by fires in the past and were of little value even for pulpwood. To allow the more valuable pines to grow, the woods needed the low grade hardwoods weeded out.

Leggett has completed the reforestation of his open land and is ready to start weeding his natural woods. He will use a tree injector, loaned by the district. ♦

James Leggett (above) admires 5-year-old loblolly pines on former cotton land. The pines will be ready to thin for pulpwood when he retires. Standing in a cotton field (below), he and Work Unit Conservationist E. H. Whitaker examine Leggett's conservation plan.

CONSERVATION PROFILE

George Bagley

Louisiana

Former accountant takes lead in conservation

THEY say if you want to get a job done, find a busy man to do it. George R. Bagley, St. Joseph, La., fits the description. He is busy. He gets the job done.

Cotton farmer, cattleman, secretary-treasurer of the Tensas-Concordia Soil and Water Conservation District of Louisiana, president of the Louisiana Association of Soil and Water Conservation District Supervisors, area vice-president (area IV) of the National Association of Soil and Water Conservation Districts, and member of the Louisiana Water Resources Committee all are titles belonging to George Bagley.

He is a member of the Tensas Parish Gravity Drainage District No. 2, a graduate accountant and businessman, a World War II Naval Officer, member of the Soil Conservation Society of America, the Farm Bureau, the Louisiana Forestry Commission, the Louisiana Cattlemen's Association, and Louisiana Delta Council.

Prime mover in watershed

He was a prime mover in the North Tensas watershed and serves on the board of directors. His influence spurred the organization of the South Tensas watershed, recently approved for planning. Nearly every acre of his home parish is now included in a Public Law 566 watershed project. The North Tensas watershed is almost completed.

Because he is a responsible citizen and good businessman he is a stockholder in a number of institutions. These include a chemical company, a 12,000-acre plantation, a life insurance company, and two banks. One of the banks was founded by Mrs. Bagley's father at Newellton. The other is at St. Joseph, both in Tensas Parish.

Bagley and his friend, Richard Thompson, of Colfax, La., chairman of the State Soil and Water Conservation Committee, are mainly responsible for a $90,000 appropriation by the Louisiana legislature last year, to speed up watershed planning in their State.

He is a member of the Louisiana Advisory Committee on Conservation and Resource Use Education and is a working proponent of conservation education wherever the opportunity occurs.

On people-to-people tour

Last year George joined a group taking a people-to-people tour of Europe and Soviet Russia. He brought back pictures and impressions with which he has spread the word about land use and treatment in that part of the world.

Meanwhile, back at Sunnyside Plantation, George and Barbara Bagley have established a conservation showplace.

When they took charge of their holdings in 1948, they fenced each field in rectangles with square corners. But after they studied their soil and capability map and made their conservation plan they decided that wouldn't do. So they tore down the fences and started all over. This time, they fenced according to land capability boundaries.

George had taken a year's leave from his accounting firm in Indiana to come to Louisiana and get Barbara's grandfather's estate on a sound basis. That was 1948. That year has stretched into 18 crop seasons, 3 lovely children, a beautiful home on the shore of Lake Bruin, and solid citizenship in Louisiana.

Serious about conservation

Rebuilding fences wasn't the only sign that the Bagleys were serious about using the land within its capabilities and treating it according to its needs. If the land was heavy clay and not suited to continuous row crops, he planted grass on it. Now there are 658 acres of improved pasture that provides grazing and hay for his 300-cow beef herd.

Cropland on the Bagley's Sunnyside Plantation grows cotton —on the land best suited to row crops and rotated with small grain, corn, and millet or sorghum. Some of the land has been leveled for better drainage and more efficient use of irrigation water. Ten miles of drainage ditches have been installed to conservation specifications.

Besides the 658 acres they own, the Bagleys rent another 585 acres from a relative and supervise the renting of another 1,078 acres. Their conservation accomplishments spread over all, owned or not.

George is a district cooperator in another State. On his grandparent's land he is applying two conservation plans with the Madison County Soil Conservation District in Indiana. His great-grand-

father received a government land grant in 1833, and the land has been in the family since then.

Barbara is a conservationist, too. In addition to keeping George's calendar in line she is active in the State, area, and National Ladies Auxiliary of Soil and Water Districts. ♦

Tom Dale

Writer, Editor 1899-1965

Tom Dale, former editor of *Soil Conservation*, 1956 to 1961, died at Leesburg, Va., July 11. He was born at Headrick, Okla.; graduated from Oklahoma State University in 1923, and did graduate work at Colorado State University. He worked for the Soil Conservation Service from its beginning in 1935 until his retirement in 1961.

Tom Dale was one of the crusading conservationists of the Thirties who aroused the public to the problem of soil erosion. He began his career with SCS (then the Soil Erosion Service) traveling in Oklahoma with Regional Director N. E. Winters and speaking to meetings by day and by night. A vigorous disciple of Hugh Hammond Bennett, he served as regional information officer at Salina, Kans., and Amarillo, Tex., before coming to Washington in 1945.

He was author of a book, *Topsoil and Civilization*, published by the University of Oklahoma Press in 1955 and later translated into several languages.

For the Soil Conservation Service he wrote the following pamphlets published, except for the first, by the Department of Agriculture:

1940. *Conserving Farm Lands.* With W. A. Ross. U. S. Department of the Interior, Vocational Division Bulletin 201. 104 pages, illus.

1941. *Conservation Farming for the Hard Lands of the Southern Great Plains.* Unnumbered. 27 pages, illus.

1941. *Conservation Farming for the Sandy Lands of the Southern Great Plains.* Unnumbered. 25 pages, illus.

1941. *Conservation Practices for the Range Lands of the Southern Great Plains.* With J. S. McCorkle. Unnumbered. 32 pages, illus.

1945. *To Writers of the Soil Conservation Service: How Does Your Writing Read?* Unnumbered. 8 pages.

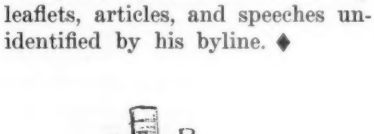
1947. *When Drought Returns to the Great Plains.* Farmers' Bulletin 1982. 14 pages, illus.

1948. *Writing for Your Readers.* Unnumbered. 22 pages.

1950. *For Insurance Against Drought—Soil and Water Conservation.* Farmers' Bulletin 2002. 22 pages, illus. Revised 1962.

1955. *Grass Crops in Conservation Farming.* With Grover F. Brown. Farmers' Bulletin 2080. 22 pages, illus.

In addition, Tom Dale wrote many leaflets, articles, and speeches unidentified by his byline. ♦



To Save the Soil. By Naomi Talley. *1965. Dial Press, New York. 79 pp., illus. $2.95.*

This brief, concise book for children from the fourth to the seventh grades is one of the better children's books on soil conservation to come out in recent years. The author tells the story of the formation of the soil, of man's misuse of it, and of his efforts to conserve it while using it to meet his needs. Pioneers in soil conservation are introduced to the reader. Attention to recent developments in soil conservation, including the work of soil conservation districts, makes this a modern book.

Mrs. Talley is a former school teacher, former employee of the Soil Conservation Service, and feature writer for newspapers and magazines. With this background she is well qualified to produce a book in the field of children's literature, where the need is so great. —A. B. Foster.

New Publications

New Opportunities in Rural Recreation. By Soil Conservation Service. *1965. Script for slide presentation, 50 pictures.* This is the first of a new series of informational materials. The leaflet contains black-and-white reproductions of the slides and a brief narration to go with each. The slides can be purchased from the Photography Division, Office of Information, USDA, for $5.50 a set. Filmstrips are available from Photo Lab., Inc., 3825 Georgia Avenue, N.W., Washington, D. C. 20011, for $5.00 each.

Soil and Water Conservation Activities: A Guide to Leaders of Girl Scouts. By Albert B. Foster and Adrian C. Fox. *1965. USDA PA-664, 30 pp., illus.* The fifth version of this popular booklet of conservation projects for young people. Previous editions were addressed to teachers, Camp Fire Girls, Boy Scouts, and 4-H Clubs.

Public Water Supplies of the 100 Largest Cities in the United States. By Charles N. Durfor and Edith Becker. *1962. U. S. Dept. of Int., Geol. Surv. Water Supply Paper 1812. 364 pp., illus., maps, tables. $2.00.* A general discussion of public water supplies of metropolitan areas followed by data for specific cities.

Soil Surveys

Covington County, Mississippi. By Walter E. Kennan and William A. Cole. *1965. 91 pp., illus.; maps 4 inches to the mile (1:15,840).* Field survey by Walter E. Kennan, Robert E. Fulgham, Kenneth H. Byers, Morris E. Shaffer, and Lewis R. Watts.

Washington County, Florida. By H. F. Huckle and H. H. Weeks. *1965. 119 pp., illus.; maps 4 inches (1:15,840).* Others participating in the survey were E. M. Duffee, A. L. Furman, M. L. Harrell, M. W. Hazen, Jr., K. J. LaFlamme, B. W. McEwen, and B. P. Thomas.

Warren County, Mississippi. By William A. Cole and R. C. Carter. *1964. 73 pp., illus.; maps 4 inches (1:15,840).* Fieldwork by H. C. Lane, V. H. McGehee, and William Clark.

From the Administrator:

Conservation Careers

THE idea of conservation careers—their development and fulfillment—has been deeply engrained in the Soil Conservation Service ever since its beginning as a nationwide agency back in the Thirties. It is so much a "way of life," rather than a set of procedures and policies on paper, that we in the Service tend to take conservation careers for granted.

A year like 1965, with its succession of distinguished careerists leaving SCS by retirement, gives us a fresh awareness of our career system.

There is something genuinely right about a system that gives us such men as J. C. Dykes, known throughout the country for his pioneering contributions to soil and water conservation; a cause that claims 30, 35, or more years of dedicated service from such leaders in their respective fields as Bill Allred, Ray Walker, Ed Graham, Paul Jacobson, "Bones" Norton, Felice Orsini, Ed Swain, Arch Work, to name only a few.

We need to remind ourselves of the critical importance of the human resources, the organizational "climate," and, yes, the good old-fashioned hard work required to establish and nurture a career system that makes the SCS a leader in the conservation field.

It is no accident that when these important people joined the growing number of "SCS Conservationists Emeritus," we had within our own ranks not just one but, in most cases, a good number of excellent candidates from which to fill their diverse and crucial jobs.

Just review in your mind the replacements already announced: Among them Norm Berg for J. C. Dykes, Courtney Tidwell for Ray Walker, Ken Cornforth for Paul Jacobson, Fred Prange for Ed Graham, Ken Grant for Ed Swain, "Spike" Koechley for Felice Orsini—the list goes on and on. Watch these personnel announcements as they come out; they are milestones in our SCS career development program.

If all this is no accident, how did it come about? It has come about through the early adoption Servicewide of a career policy and program resting on a very simple base—the determination to recruit quality people and provide them with opportunities for self-development so that a substantial reservoir of "best qualified" conservationists would be available for each vacancy that develops.

Notice that I say "conservationists." I mean that to include *all* of our positions. It is important to the progress of the Service that all its employees, whether they serve as soil conservationists, range conservationists, design engineers, or State administrative officers, develop their specialized skills and careers in the setting of conservation and motivated by the philosophy of conservation.

Lest all this sound too easy or too academic, let me be more specific about what it takes to carry out such a basic policy.

First, recruitment can never be a casual, end-of-the-fiscal-year business. Recruitment must be a real and effective "quest for excellence." We must seek the *best* of the graduating classes. We must use the student trainee program consistently, not sporadically, to bolster our work force. We must *plan* recruitment, based on long-range needs to maintain our work force at its required strength.

Next, from the day the new employee enters on duty, his *development* must be initiated and pursued to the extent needed for him and the Service to realize the greatest possible dividends from his talents and abilities. We cannot "mass produce" employee development. Each person is an individual in his own right, with differing abilities, interests, and career objectives.

Of course, we provide group training for all new professional and subprofessional employees, for supervisors and managers, for specialists and others. But by far the most development occurs on the job, in the right environment, under good supervisors.

As a new employee advances in the SCS career network, he needs to broaden his horizons and adapt himself to meet new challenges. This can't be done standing still in the same job or even in the same geographic region.

An employee on the way up welcomes the challenge of rotation or job changes, and, if it comes, the opportunity of attending graduate school at a university in resource development and management.

Finally, our program of developing conservation careers puts great stress on multiple appraisals; that is, evaluation of employees not only by their supervisors but by two or more others who are in a position to know them. This includes not only evaluation of present performance, based on objective observation, but also the best considered judgment as to their potential for the future.

We have been in this business of developing conservation leaders as long as we have been in existence as an agency. Our present and long-time professional standing, both nationally and internationally, reflects what has been done in the past. But new challenges keep looming ahead. Let's make our conservation career program even more productive in the future.

—D. A. WILLIAMS

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Districts Train Children in the Conservation Way

IN the Eastern and Western Grand Forks counties soil conservation districts, N. Dak., training a child in the conservation way begins not later than the seventh and eighth grades.

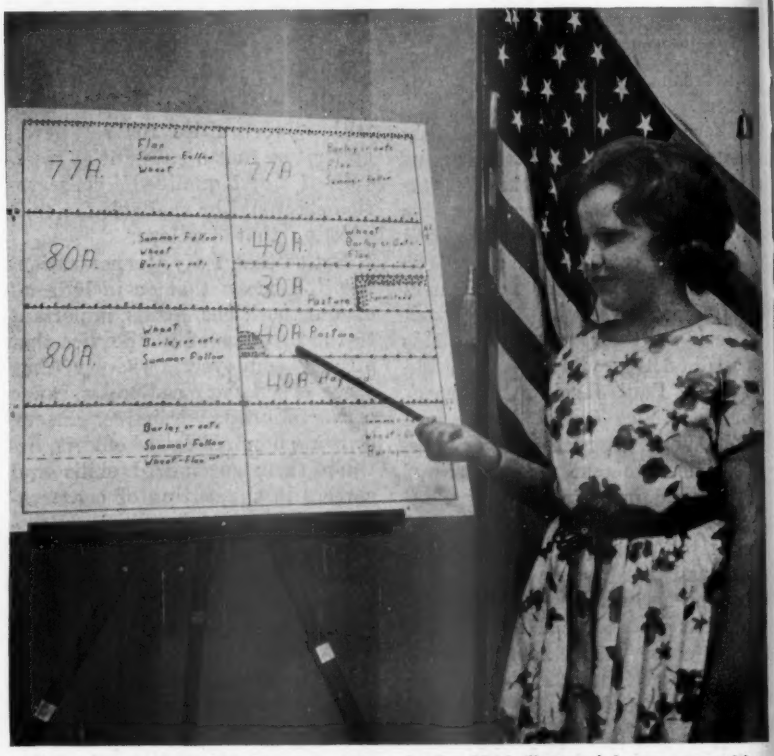
In 14 years, 1,024 seventh and eighth graders have learned about the soil and its relationship to the welfare of society.

The supervisors of the conservation districts are, of course, in the thick of it. Working with them are the county superintendent of schools, the Grand Forks County Bankers Association, the newspapers, the radio and television stations of the county, and the Soil Conservation Service.

An unusual and popular feature of the program is the development of conservation farm plans by the students. And there are exhibits, scrapbooks, posters, illustrated lectures, essays, speeches, and conservation jingles. The county's banks provide prizes for the best efforts in each category.

These special projects supplement the classroom use of a special text, "The Conservation of Natural Resources of North Dakota," in carrying out the State curriculum requirement that conservation be taught in all public schools.

Visits, too, are made to headquarters of the county agent and SCS. At school, soil conservationists come to talk and show pictures.



Evelyn Lommen of Rye School was a winner in the 1964 illustrated lecture competition, using a farm plan she prepared as a class exercise.

The investment pays off in many ways, the supervisors say. One is in the inevitable effect on the farm family. When the youngsters begin asking questions about conservation on the farm, Dad and Mom are sure to take a closer look at their own farm plans.—M. C. LUND, *Soil Conservationist, SCS, Grand Forks, N. Dak.* ♦

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